Ethnically diverse pluripotent stem cells for drug development.

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Authors: Eyitayo S Fakunle, Jeanne F Loring

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Public Summary:
Genetic variation is an identified factor underlying drug efficacy and toxicity, and adverse drug reactions. Here, we discuss the benefits and challenges of using iPSCs to introduce genetic diversity into the drug development process.

Scientific Abstract:
Genetic variation is an identified factor underlying drug efficacy and toxicity, and adverse drug reactions, such as liver toxicity, are the primary reasons for post-marketing drug failure. Genetic predisposition to toxicity might be detected early in the drug development pipeline by introducing cell-based assays that reflect the genetic and ethnic variation of the expected treatment population. One challenge for this approach is obtaining a collection of suitable cell lines derived from ethnically diverse populations. Induced pluripotent stem cells (iPSCs) seem ideal for this purpose. They can be obtained from any individual, can be differentiated into multiple relevant cell types, and their self-renewal capability makes it possible to generate large quantities of quality-controlled cell types. Here, we discuss the benefits and challenges of using iPSCs to introduce genetic diversity into the drug development process.